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ABSTRACT

This guide is a collection of ideas for mathematics activities which were assembled and tested by primary teachers. The activities supplement the teaching of basic numeracy and include topics such as algorithms, pyramids, magic squares, multiples, and number values. The guide is organized into four sections: (1) addition and subtraction; (2) multiplication and division; (3) exercises involving the four rules; and (4) word problems. Worksheets for each activity are also provided. (DDR)

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Exercises and Activities in Basic Number Work

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- Volunteers and local colleagues contributing to production of publications.
- Organisation of Caribbean Overseas Development (OCOD) for assisting in the reproduction of these publications

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EXERCISES AND ACTIVITIES

IN

BASIC NUMBER WORK

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PREFACE

This collection of ideas was assembled and tested by primary teachers at Rose Hall Government School and Chateaubelair Methodist School, North Leeward , St. Vincent, E. Caribbean.

Jan Dingley, V.S.O., worked with the teachers advising on ways of developing practical exercises and activities in the teaching of Mathematics.

Some of the ideas (or variations of them) have been used for many years, others have developed at meetings and workshops.

ACKNOWLEDGMENTS:

Mr. B. Stapleton, Mr. R. Ferdinand, Mr. R. Chambers, Mr. R. Stapleton, Mr. V. Crooke of the Rose Hall Government School.
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SMP Maths Scheme, Cambridge, UK.
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Typing, design and Graphics by Mr. S. Jocelyn, Maths Teacher, Troumaca Ontario Secondary School.

INTRODUCTION

This booklet contains exercises and activities (with answers) which will supplement the teaching of basic numeracy. Children need to be competent manipulating addition, subtraction, multiplication and division of numbers if they are to make any progress in mathematics i.e. if they are to develop a range of mathematical skills and competencies . Repetition can become boring - the value of repeating the same exercise daily will eventually have negative effect. However, children do need plenty of practice to acquire these skills - how do we address this problem? ..... By providing a range of activities on the same topic.

It is hoped that the exercises in this booklet will enable teachers to move towards fulfilling this need. It is assumed that some of the basic principles have been taught and that teachers are looking for additional exercises to supplement the teaching of these basic skills. This is a resource book, dip into it, select appropriate material, modify the degree of difficulty to suit the class and extend your pupils' range of mathematical experiences.

We hope that you will find plenty of exercises to keep their motivation levels high.

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ADDITION AND SUBTRACTION

ADDITION AND SUBTRACTION

This section gives plenty of exercises and examples which provide plenty of practice at these two fundamental concepts. Use these exercises as part of a lesson, give them as a five - minute puzzle, use them for homework exercises ..... all involve addition and/or subtraction, disguised in a variety of activities. Little preparation is required - most exercises can be copied from the blackboard.

Remember to vary the level of difficulty to suit the ability level of your class..... and don't be afraid to let the children make up their own examples to test their friends - it's all part of the mathematical experience which reinforces the concepts - and they are enjoying their maths whilst learning.

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SUMS TO.....

Cross out groups of numbers which add up to 20. (Groups can be of 2 or 3 numbers from any part of the grid)

3	5	9	12
6	4	8	7
10	7	11	5
1	9	2	14
6	13	10	12

List the groups on a separate sheet of paper.

Find groups of 3 next - door numbers which add to 100. The lines may be horizontal, vertical or diagonal.

17	9	18	75	94	50
81	47	96	55	5	40
2	50	48	93	1	14
47	25	45	33	36	44
27	69	38	54	19	59
26	71	59	37	4	48

List each set of numbers that you find on a separate sheet of paper.

NB. Vary the numbers in both these sums to grids to suit the ability level of the class.

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FIND THE SQUARES

2	6	1	4	3
5	3	0	2	1
1	1	4	5	2
2	6	5	3	2
3	4	2	1	4

This square of four numbers adds up to 10. 3 + 2 + 1 + 4 = 10

Find five other squares of four numbers which add up to 10.

List the numbers on a separate sheet of paper.

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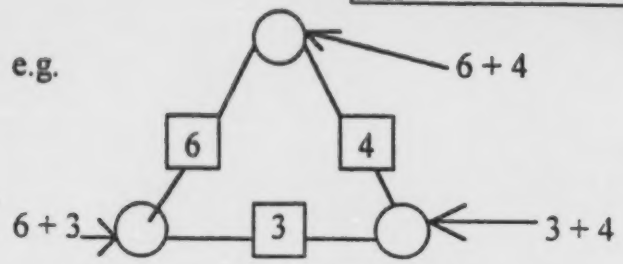
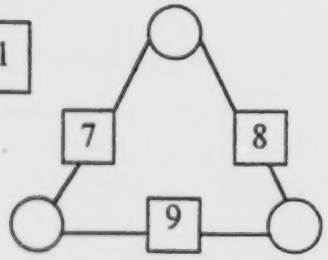
e.g.



Complete the following 'arithmogons' in the same way.

1



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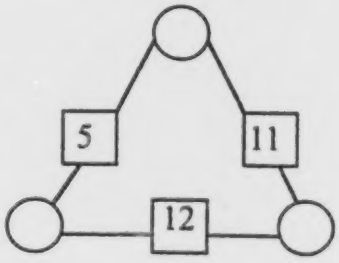

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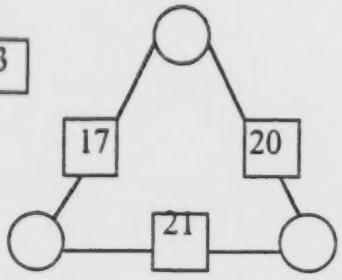

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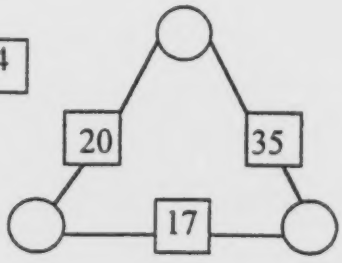

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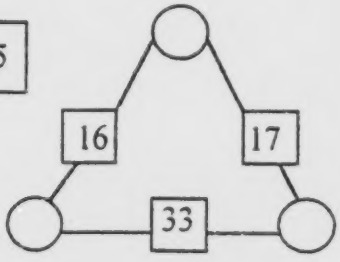

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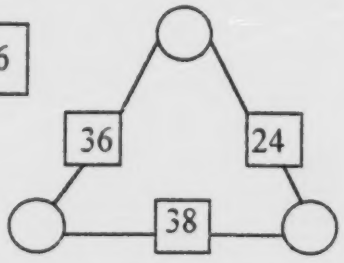

Extension

Multiply the numbers in the squares.

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PAIRS

3	7	2	9	1
4	6	3	8	6
1	8	4	5	3
5	1	2	7	6
5	9	7	4	2

Look at horizontal and vertical PAIRS

3	7	2	9	1
4	6	3	8	6
1	8	4	5	3
5	1	2	7	6
5	9	7	4	2

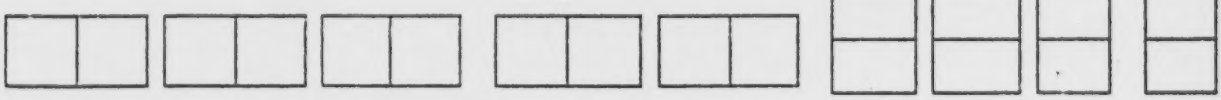
6	3

TOTAL 9

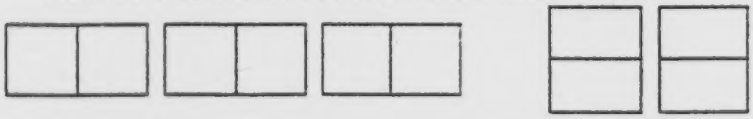
7
4

TOTAL 11

There are nine different PAIRS with a total of 9. Can you find them?



Find five different PAIRS with a total of 10.



ALL PAIR TOTALS can be found between 3 and 17 except two.

Which ones?

Create your own square and make up some questions like these.

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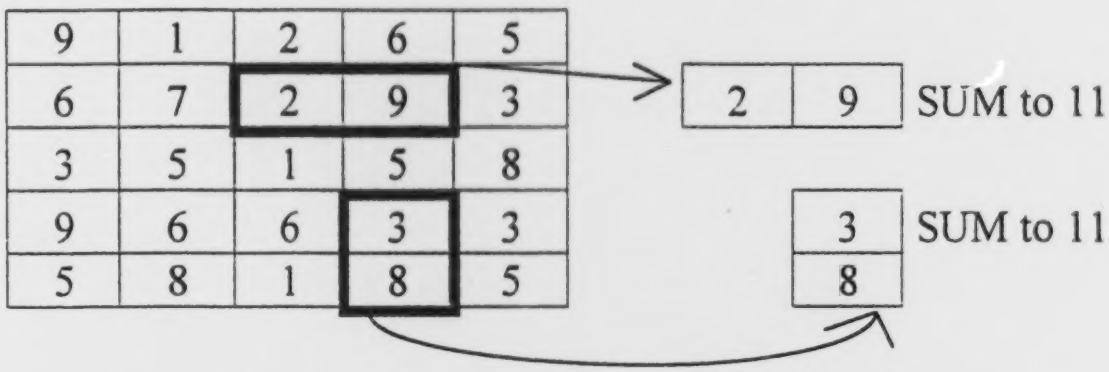
ADD

PAIRS

9	1	2	6	5
6	7	2	9	3
3	5	1	5	8
9	6	6	3	3
5	8	1	8	5

Look at horizontal and vertical pairs.



How many pairs sum to 8 ?

There are 2 vertical pairs that sum to 12
Can you find them?

All pair totals can be found between 3 and 15 except one.

Make your own square : can you make all the totals between 1 and 20 ?

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MORE PAIRS

3	6	6	1	3
6	2	3	4	7
1	3	1	1	3
0	3	5	1	2
4	2	5	5	6

Cover a pair of numbers that adds up to 1, then a pair that adds up to 2, etc.
Continue up to a pair that adds up to 12.
One number is left. What is it?

10	5	11	8	2	4	5
12	1	7	14	5	3	0
11	0	4	2	7	9	8
9	5	8	8	7	2	2
9	1	17	14	1	1	7
5	7	5	10	8	4	3
6	3	2	11	9	7	9

Cover a pair that adds to 1, a pair that adds to 2, etc. The last pair to be covered will add to 24.

Which square will be left uncovered?

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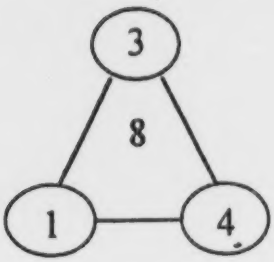
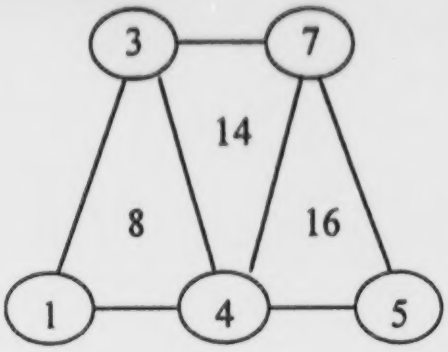
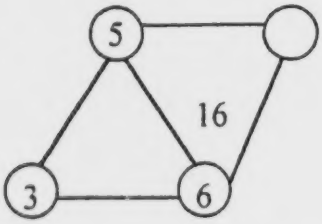
NUMBER PLANS





Complete these:

1.



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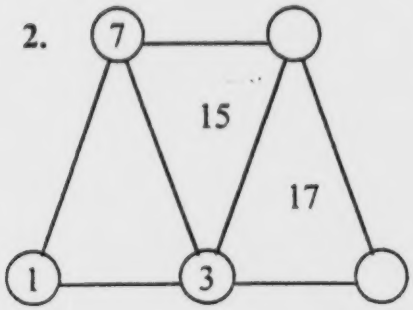

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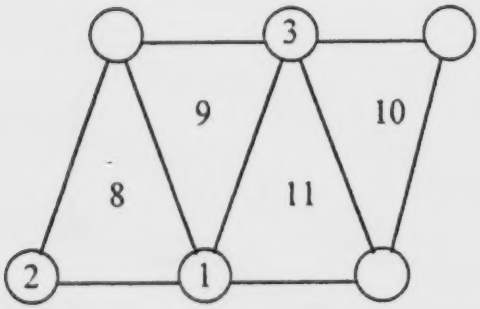

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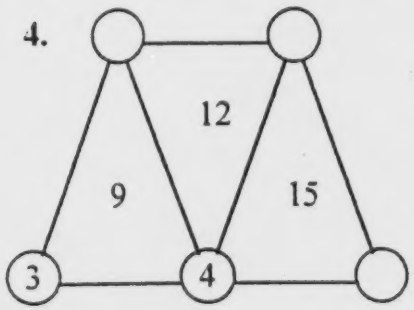
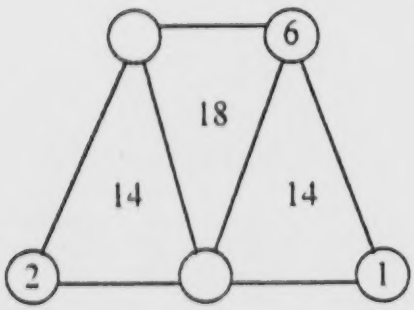


In questions 6,7,8,9 use all different numbers.

5.



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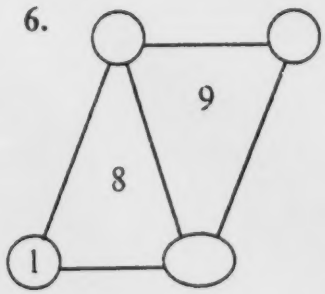

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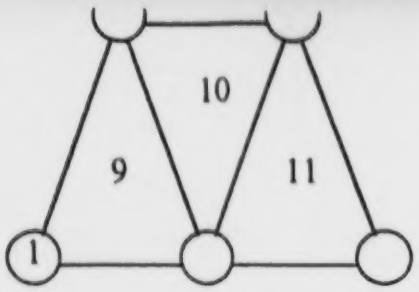

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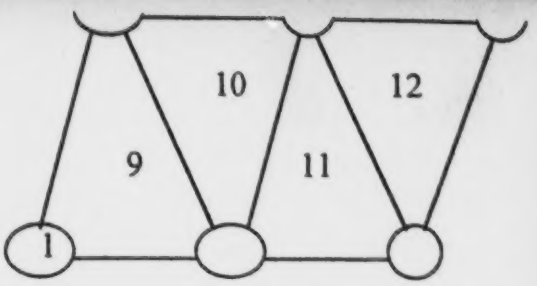

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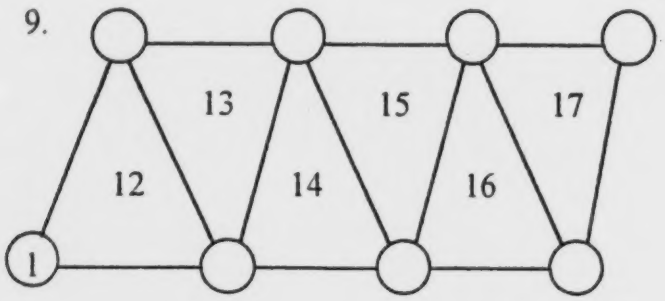

MEANDERING

Place the digits 1 to 9 on a 3 by 3 grid
e.g.:

3	6	9	= 26
1	2	8	
5	4	7	

The dotted line shows the trail 5 + 4 + 2 + 6 + 9 = 26
(Diagonal moves are not allowed and you can only visit a square once).

Find as many other trails as you can.

How many different totals are there?

Rearrange the numbers in the grid- What happens to the totals?

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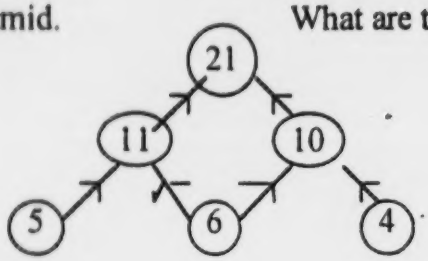
PYRAMIDS

Here is an addition pyramid. What are the rules?



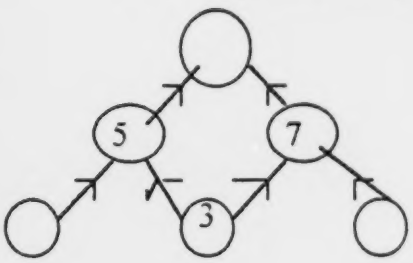
(1) Draw pyramids that start with:

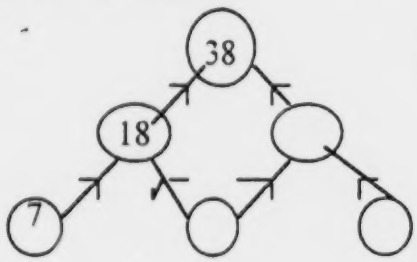
(a) 1, 2, 3 (b) 3, 5, 9 (c) 5, 10, 15

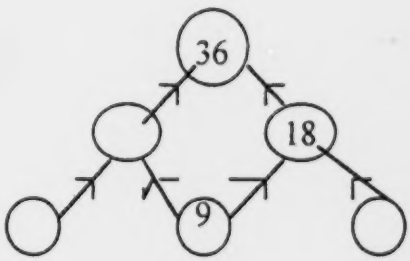
(d) 10, 20, 30 (e) 8, 16, 11 (f) 26, 19, 32

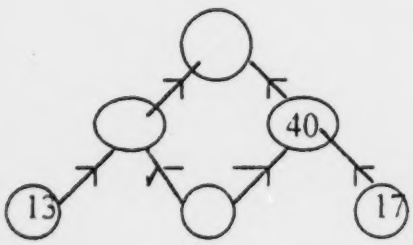
(g) Make some with your own numbers.

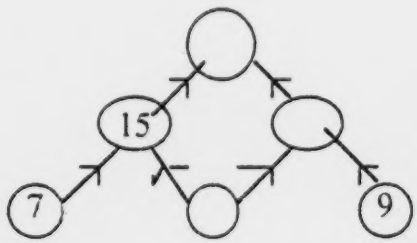
(2) Copy and complete these pyramids:

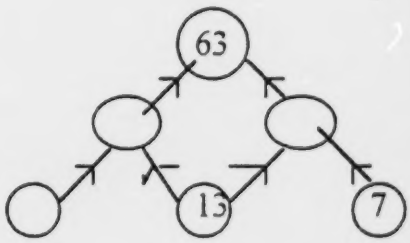


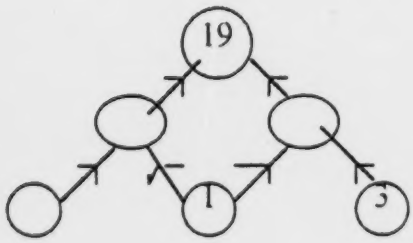


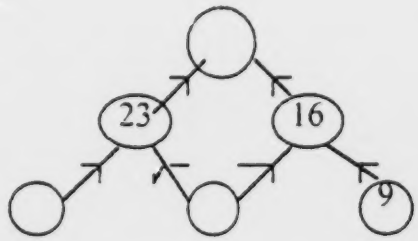


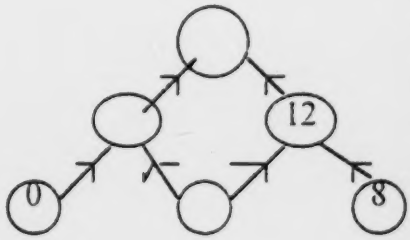












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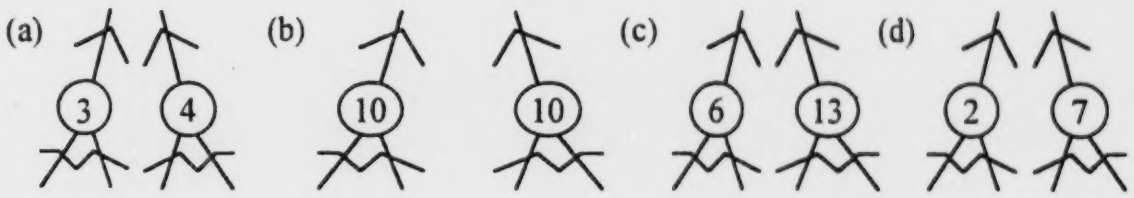
(3) Draw and complete as many pyramids as you can with a middle row of :



(4) Try to draw 6 different pyramids for each of these top circles:-

---

NB These pyramids can be drawn on the blackboard for children to copy into their books. It may be easier to prepare stencils or handy sheets containing 'empty' pyramids. (Sorry, this is more work for the teacher but easier for the children).

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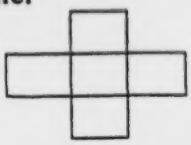
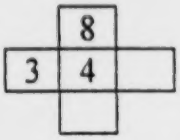
ADDITION CROSSES

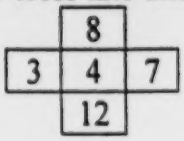
Draw a cross like this. You need not use a ruler



Write 3, 4 and 8 in the cross like this.

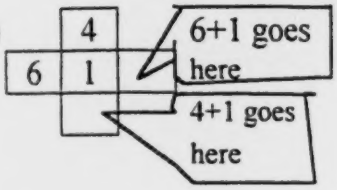


Do 3 + 4 and 8 + 4
Write the answers in the cross like this

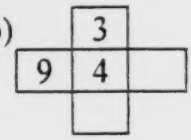


1. Copy these crosses and fill in the missing numbers.

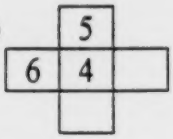
(a)



(b)

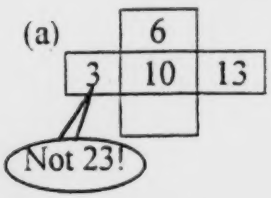


(c)

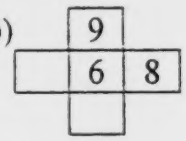


2. Copy these crosses.
Work out the missing numbers and fill them in.

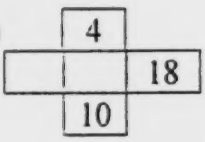
(a)



(b)

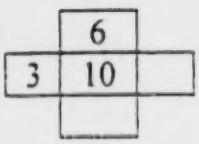


(c)

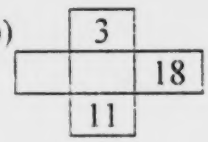


3. Copy these crosses and fill in the missing numbers.

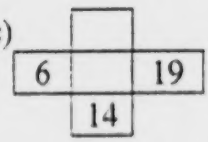
(a)



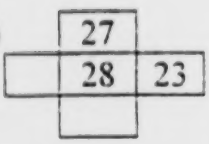
(b)



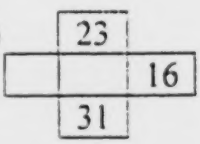
(c)



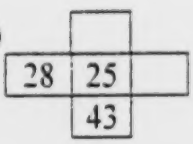
(d)



(e)



(f)



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(4) Draw empty crosses and fit these numbers in:

(a) 8, 13, 5, 2, 7
(b) 18, 7, 6, 1, 12
(c) 7, 16, 9, 10, 3
(d) 18, 8, 6, 2, 24
(e) 31, 9, 16, 25, 15

MAGIC SQUARES

Look at this 'nine-square' puzzle.

5	3	8
6	4	10
11	7	18

Across

5 + 3 = 8
6 + 4 = 10
11 + 7 = 18

Down

5	3	8
+6	+4	+10
11	7	18

1) Copy and finish each of these nine-square puzzles.

(a)

7	8	
5	3	

(b)

	6	14
3		
	9	

(c)

6		
		21
	13	30

(d)

	8	
	9	12
		20

(e)

11		
	15	
14		37

(f)

		16
14		
	16	30

(g)

		10
21		
29	13	

(h)

	7	13
	2	18

(I)

		0
	0	
0		

2) Make your own nine-square puzzles.

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Magic Squares

Complete the following ' magic squares' :
(Each row, column and diagonal must add to give the same total).

1)

7	12	1	
	13		11
16		10	
9	6		4

2)

6	13		17
19	16		
	10	21	
20	15		

3)

16	3		13
5	10		
	6	7	
		14	1

4)

1	8		12
14	11		
	5	16	
15	10		

5)

16	2		13
	11		
9	7	6	12
		15	

Extension:

Let the students make their own magic squares.

Challenge: Find the magic number
Complete the magic square.

5	46	15	56	25	66	35		45
54	14		24	65		75	44	4
13	63	23		33	74	43	3	
62			32		42	2	52	12
21	71	31	81	41		51	11	61
70		80	40	9	50		60	20
29	79	39	8	49		59	19	69
	38	7	48		58	27	68	
37	6	47	16	57	26			77

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CLUELESS

EXAMPLE →

Write the numbers from 1 to 9 in the boxes of each puzzle to match the row and column totals.

Some clues are given:

7	3	4	14
1	5	9	15
6	8	2	16
14	16	15	

1)

			12
	2		16
			17
20	6	19	

2)

8			21
			15
			9
19	19	7	

3)

			10
			21
3			14
15	9	21	

4)

			14
			19
			12
6	17	22	

5)

			13
			16
			16
15	6	24	

6)

			18
			20
			7
14	17	14	

Try them on scrap paper first.

Invent some similar puzzles using numbers 6 to 14.

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MAGIC SQUARES

	28		17	
12		24		2
13	10	8	22	29
26		16		6
	4		5	

Write the numbers in the empty squares.
Some of them have been done for you.
13 + 10 + 8 + 22 + 29 = 82

All the rows and columns must add up to 82.

1 - ~~8~~ - 9 - ~~13~~ - 18
25 - 27 - ~~29~~ - 30.

	15		23	
18		25		5
	1	30	4	
27		2		6
	11		29	

Now try this one.

Only one number has been put in this time.
All the rows and columns must add up to 82 again.

3 - 8 - 12 - 13 - 21
22 - 26 - 28 - 30.

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Consecutive 50's

In the grids below:

1. Any four consecutive numbers in a row total 50
2. Any four consecutive numbers in a column total 50
3. Any four consecutive numbers in a diagonal line total 50
4. The four numbers in a 2 x 2 square total 50.

Complete the grids.

11	16		18	11	16		18
6		12	15	6		12	15
20		14		20	7	14	9
	10	19			10	19	
11	16	5		11			18
6		12	15		17		15
20	7	14		20		14	9
13	10		8		10	19	

Can you spot the patterns?

18		9	8		15	9	8
5	12		19	5		14	19
		7	10	16		7	10
11	6			11			
	15		8		15	9	8
5	12	14			12	14	19
16		7	10	16		7	
11	6		13	11			13

<u>Extensions:</u>

(1) Let the students make their own grids.

(2) Use different totals.

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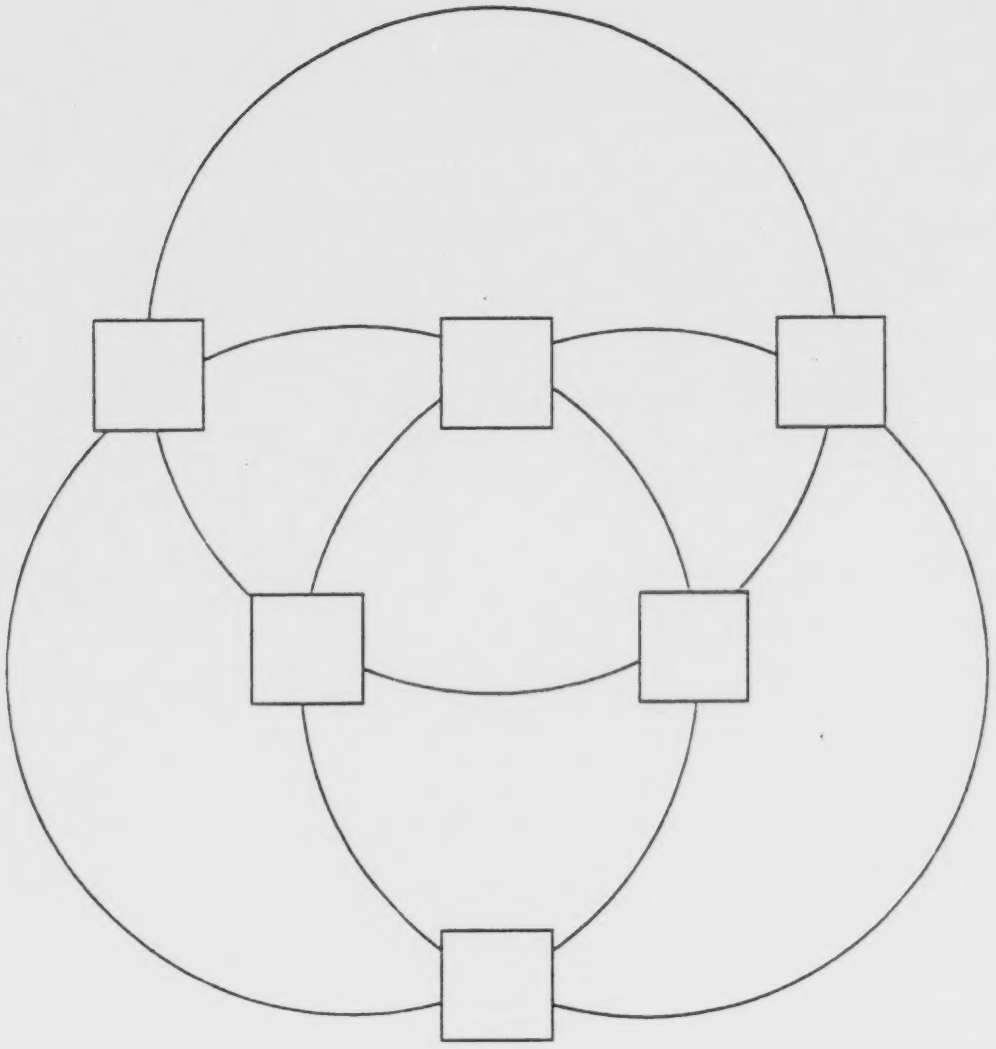
CONSECUTIVE 50'S

Any four consecutive numbers in a vertical, horizontal or diagonal straight line, total 50.
Any four numbers in a 2 x 2 square total 50.
Complete the block:

11	18		6	11	18		6	11	18	15	6	11	18	15	6
16	5		17	16		12	17	16			17		5	12	17
10		14	7		19	14	7		19	14	7		19		7
	8	9		13	8		20			9	20	13		9	
11	18			11	18	15	6	11	18	15		11	18	15	6
16	5		17	16	5			16	5		17		5	12	17
		14	7		19	14	7		19		7	10	19	14	
13	8		20	13	8	9	20		8	9	20	13		9	20
	18	15		11		15	6	11	18	15		11	18	15	6
16	5	12		16	15		17				17	16	5	12	
10		14		10	19		7	10			7				7
	8	9	20		8	9	20		8	9	20	13	8	9	
11	18	15	6	11			6	11	18		6		18	15	6
16	5	12		16	5	12		16			17	16	5		17
		14	7		19	14	7		19	14				14	
13	8		20	13		9	20		8	9	20		8	9	20

Magic Circles



Put the numbers 1, 2, 3, 4, 5 and 6 into the squares so that the numbers on each circle add up to the same amount. When this happens the circles are said to be magic.

How many different ways are there of doing this?

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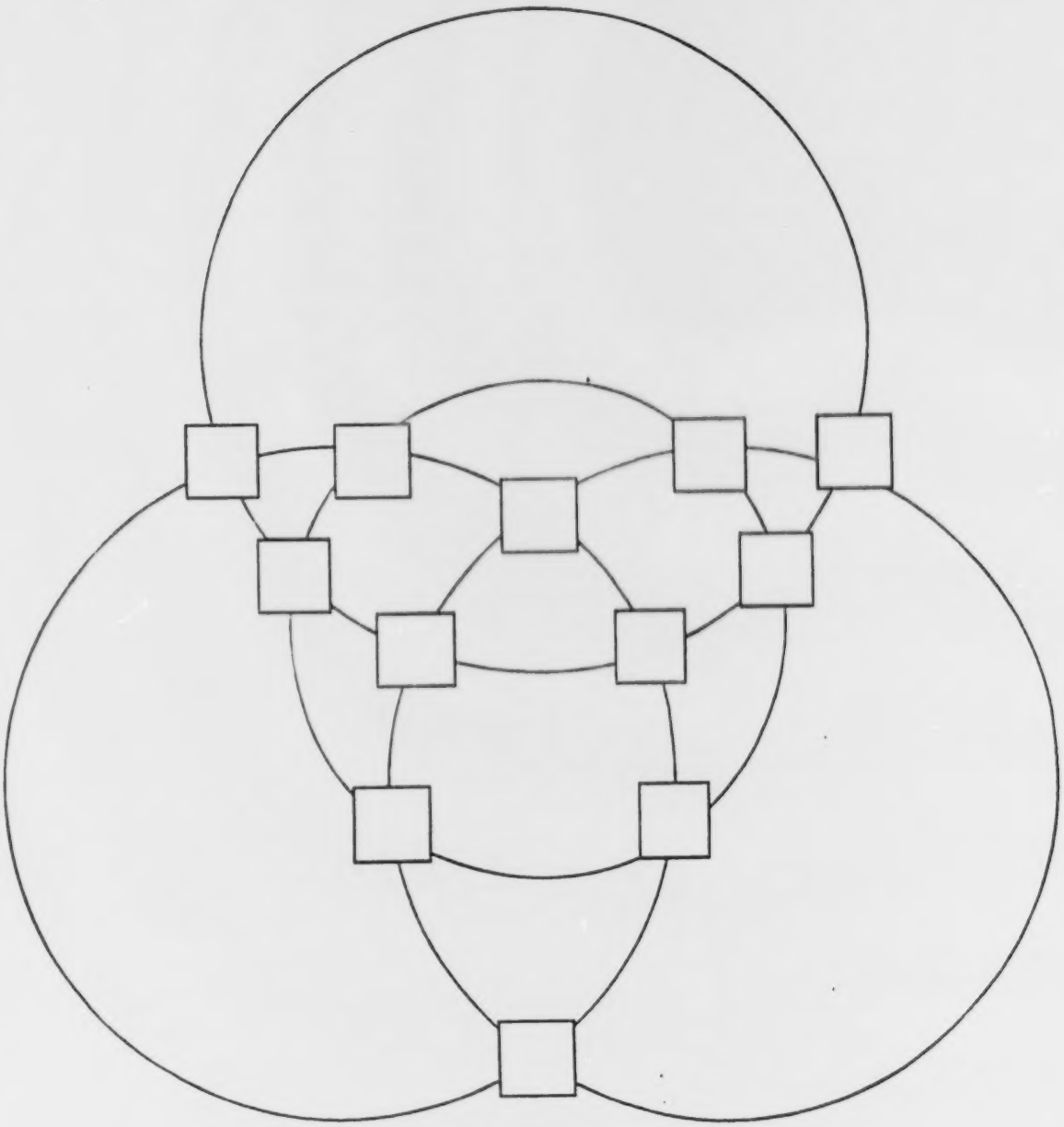
Magic Circles (2)



In this diagram there are four circles.

Use the numbers 1 to 12 to make them into Magic Circles.

0 - 9 CARDS

These activities can be led by the teacher with the whole class taking part. In this case , write the digits 0, 1, 2, ——— 9 on the blackboard and cross them off as they are used. Each digit should be used only once in finding solutions to these exercises.

Alternatively, let the children work individually (or in pairs or groups) solving the problems. In this case, each child will need a set of digits - these do not need to be elaborate - cut squares of paper.

Ideally, all work should be written into the children's exercise books.

Use all the 10 cards and find:

2 cards that add to 16

2 cards that add to 14

2 cards that add to 2

2 cards that add to 9

2 cards that add to 4

Cards that add to 7, 8, 9, 10 and 11

Try using 2, 3 or 4 cards to make the totals.

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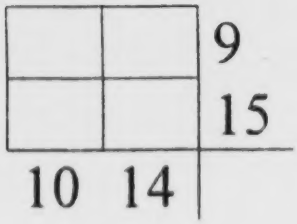
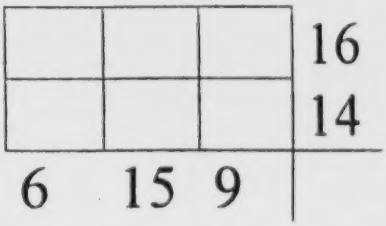
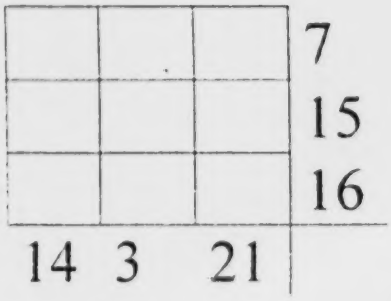
0 - 9 Cards

Draw the grids

Place the cards in the squares to make row and column totals correct :







Try some of your own.

Choose 4 cards from the set.

Use some or all of the cards to make totals from 1 to 20 - use any signs.

e.g.. 4 + 2 + 1 = 7

4 + 2 - 1 = 5

Try making totals from 21 to 50. or 100!

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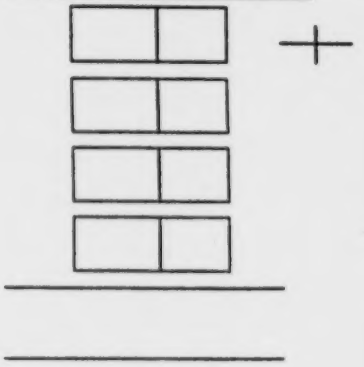
INVESTIGATIONS

You need an extra '1' and '3' cards.

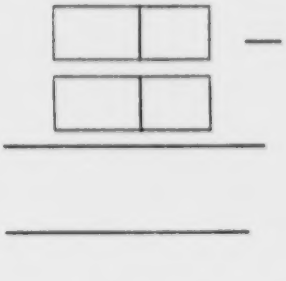
Summing up.

Put the digits 1, 1, 2, 3, 3, 4, 5, 6
into the boxes to make four
two - digit numbers.
Add. What different totals are possible?



Taking away

Put the digits 1, 4, 7 and 9
into the boxes to make two
two - digit numbers. The top
number needs to be larger
than the bottom number.
How many different answers are possible ?



Nearest to 10.

Select 4 cards. You can combine the 4 digits using addition and or subtraction.
Who can obtain a total nearest to 10? 15? 20?

e.g.. 2, 4, 6, 3

4 + 6 - 3 - 2 = 11

or 4 - 6 - 2 - 3 = 9

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MULTIPLICATION

AND

DIVISION

MULTIPLICATION AND DIVISION

Most of these exercise give practice at tables. Basic drill is essential to build up an understanding of multiplication and to develop speed and accuracy.

The activities shown here provide additional 'fun' ways of 'drilling' tables which will keep children's motivation high.

One further activity (not mentioned in this section) is singing - choose rhythm or familiar tune and sing through the tables. Children love this!

MULTIPLICATION TABLES

Children often have copies of their tables on the covers of their maths books. A useful exercise is to ask children to draw the grid below, mount it on card and use it to answer 'tables questions' until they become familiar with them.

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	48	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Make a large table for the classroom wall for constant reference.

NB. This chart is also useful when discussing factors and multiples.

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MULTIPLICATION TABLES

The following multiplication grid has got mixed up. Try to fill it in. To help you get started a few have been done for you.

x	3	5	10	2	7	9	6	4	8
5									
2									
4								16	
8									
7				14					
10									
3									
9									
6									48

It is useful to have squared paper so that these exercises can be repeated as frequently as necessary. If not, draw the grid on a stencil and print as many copies as possible.

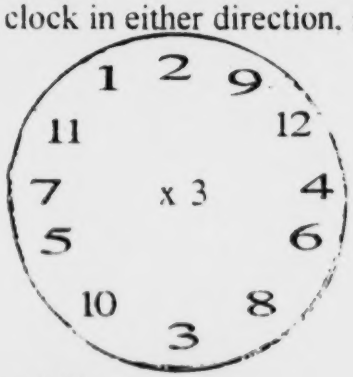
The level of difficulty should be varied to match the ability of the children.

ROUND THE CLOCK MULTIPLICATION

Tables: A few minutes drill each day is more valuable than half an hour once a week.

Draw a clock face on the blackboard with the numbers in random order.

Drill the children round the clock in either direction, starting at any number.



Change the center number to drill other tables.

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SPEED TES

These sheets could be duplicated; or make se g strips of paper and display the questions on the blackboard / wall classroom - test frequently (children will practice if the questions are co displayed).

NAME:

6 x 8 =	
5 x 9 =	=
8 x 9 =	=
7 x 6 =	=
4 x 4 =	=
5 x 6 =	=
6 x 4 =	=
3 x 7 =	7 =
7 x 10 =	x 4 =
0 x 5 =	9 x 6 =
9 x 6 =	5 x 7 =
6 x 3 =	8 x 4 =
5 x 3 =	3 x 8 =
6 x 6 =	5 x 9 =
0 x 9 =	6 x 7 =
7 x 7 =	5 x 6 =
1 x 8 =	9 x 8 =
4 x 9 =	8 x 7 =
8 x 7 =	9 x 4 =
2 x 9 =	7 x 7 =
5 x 8 =	4 x 5 =
9 x 5 =	6 x 9 =
7 x 6 =	5 x 5 =
4 x 9 =	8 x 3 =
9 x 3 =	7 x 8 =

Time :

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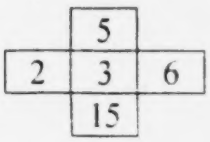
MULTIPLICATION CROSSES

Here is a multiplication cross.

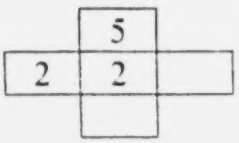


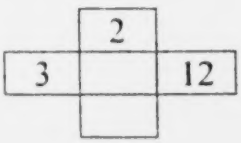
The rules are

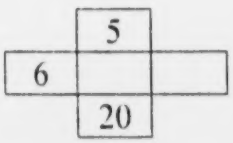
Left-hand number x Middle number = Right-hand number

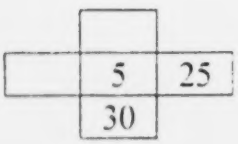
Top number x Middle number = Bottom number

1) Copy and finish these multiplication crosses.

(a)


(b)


(c)


(d)


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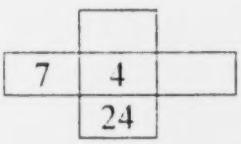

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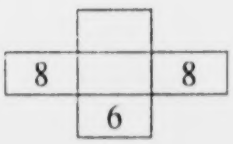

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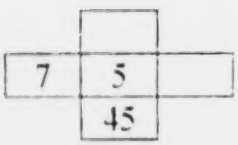

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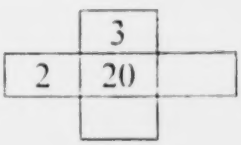

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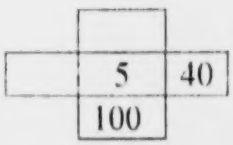

2) Draw multiplication crosses with these numbers in them:

(a) 4. 2. 10. 5. 20
(b) 3. 6. 2. 18. 12
(c) 28. 2. 8. 4. 7
(d) 3. 30. 15. 5. 6
(e) 4. 40. 24. 6. 10
(f) 3. 2. 0. 0. 0

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MULTIPLICATION GRIDS

Here is a multiplication grid.
Make sure you understand
how it was put together
before you go on.

X	3	4	8
2	6	8	16
5	15	20	40
7	21	28	56

Some of the numbers in these multiplication grids are missing.
Copy and complete the grids.

1.

x	2	4	6
2	4	8	?
5	?	20	30
4	8	16	24

2.

x	4	5	7
1	4	5	7
2	8	?	14
3	12	15	?

3.

x	5	3	4
2	?	6	8
1	5	?	4
7	35	21	?

4.

x	6	2
?	12	?
3	?	6

5.

x	2	?
?	6	12
5	10	20

6.

x	8	?
5	?	?
6	?	6

7.

x	?	3	?
?	2	?	7
?	4	6	?
?	10	?	?

8.

x	?	?
?	6	5
?	12	10

9.

x	?	?
?	9	21
?	?	49

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0 - 9 Cards

Arrange the 10 cards to make:

5 numbers which are multiples of 2

6 numbers which are multiples of 3

5 numbers which are multiples of 7

e.g. $42 = 6 \times 7$

Select a number e.g. 4

Make as many multiples if 4 as possible using the cards. i.e..

..... cards 5, 7, 9, 0 are not used.

Repeat with different numbers.

Use the 12 x 12 multiplication table to look for multiples of 4.

TURN UP THE VOLUME

1) Split the class into groups, each with a leader.

2) Whole class chants a table - but - only one group makes a sound, the other groups mime the words.

3) The leader of the group making the sounds signals another group to "turn up the volume" while the first group turns the volume down.

4) Any group which fails to "turn up the volume" is out of the game and can mime from then on.

5) The winning group(s) will be the one(s) who know their tables the best!

NB Switch to a different table part way through the game to extend the testing of tables.

SNAKES

(or Top To Tail)

Children stand in one long line around the classroom. One end of the line is the "head" the other is the "tail".

Start at the "head" and ask each child a question from the multiplication tables. If the child answers the question correctly (s)he stays in the same position. If an incorrect answer is given then that child moves to the "tail" and everyone else moves closer to the "head".

Repeat for a few minutes each day, once a week etc. - children will usually remember their positions (but it may be worth making a list).

NB.
With large classes line the children up into 2 or 3 "snakes" and ask questions to each line in turn. This will give more children a chance to reach the "head" (and try to avoid being the "tail").

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BUZZ

1) Decide which multiplication table is to be practiced. e.g.. 3 times tables.

2) Children count in ones, in turn, around the class, with everyone standing.

3) When the counting number is a multiple of the table number, the child says "BUZZ" instead of the number.

4) The next child says the number which is one more than the "BUZZ" number.
e.g.: 3 times table: children would recite:
1, 2, BUZZ, 4, 5, BUZZ, 7, 8, BUZZ, 10, 11, BUZZ, etc.

5) Any child making a mistake sits down. The winner is the last child to remain standing.

Extension: Fizz-Buzz

Repeat the above exercise using a second table. Child says "BUZZ" for multiples of 3, "FIZZ" for multiples of 5, "FIZZ_BUZZ" for numbers which are multiples of both 3 and 5.

e.g... 1, 2, BUZZ, 4, FIZZ, BUZZ, 7, 8, BUZZ, FIZZ, 11, BUZZ, 13, 14, FIZZ_BUZZ, 16 etc.

TABLE CODES

Teachers need to set up a code which uses a multiple to represent each letter of the alphabet e.g.:

A	B	C	D	E	F	G	H	I	J	K	L	M
12	27	60	81	48	18	24	80	36	72	21	144	50
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
22	30	49	35	16	56	14	40	32	20	42	110	64

The children copy out the following multiplications. work out the answer and then decode the message.

2	3	9	12	6	8	6	4	4	2	4	2	
x7	4	3	12	8	7	2	4	12	9	10	11	
14	12	27	144									
T	A	B										!

(1) Give the more frequently occurring letters numbers which have many factors so that it is easier to practice all sets of factors.

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12	150	2	40	15	6
30	96	50	27	4	36
16	8	25	64	20	54
45	120	18	3	75	125
5	72	9	32	24	60
80	48	90	10	100	216

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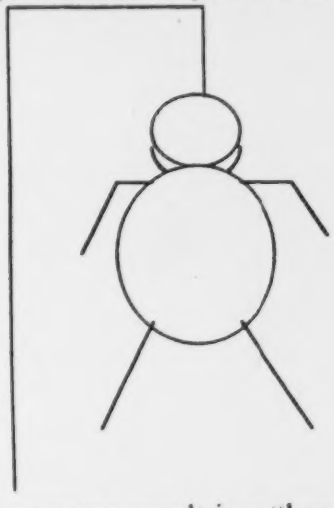
(2) Let children make up their own code message for others in the class to decode.

TABLE HANGMAN

The teacher asks the class a series of tables questions. Each time they answer a question incorrectly, or too slowly, the teacher begins to build the gallows.



10 incorrect answers result in a "hanging"

NB. Children could work in pairs, testing each other, with each child building their own gallows.

COVER THE MULTIPLE

This game gives practice at multiplication and can be played in groups. Each group needs to draw a grid of numbers:-

12	150	2	40	15
30	96	50	27	4
16	8	25	64	20
45	120	18	3	75
5	72	9	32	24

Make each grid large enough so that the squares can be covered by counters or bottle tops.

Instructions:

1) The child throws 3 dice and multiplies the numbers together. If the answer is shown he/she places a counter on the square containing the correct answer.

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2) Each child in the group takes a turn.
3) The winner is the child with most counters on the board.

NB. A counter cannot go on a square which is already covered.

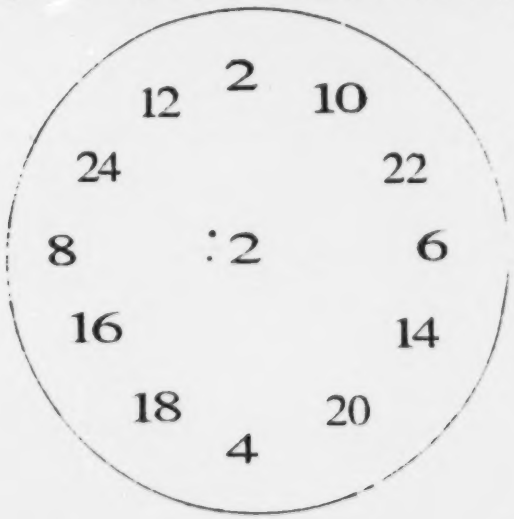
Extension:

Each child throws 3 dice in turn but the first child to work out the answer can place a counter on the board.

NB. This game could be played with other operations e.g.. addition, subtraction (2 dice) and division (fractions) - devise boards with relevant numbers.

ROUND THE CLOCK DIVISION

Draw a clock face on the blackboard with the numbers in random order. Drill the children, round the clock in either direction, starting at any number.



Change the numbers to drill other tables.

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6 3 ÷ 9 = 7

2 1 ÷ 3 = 7

Find different division sentences.

How many ways can be found to equal 3.

Can you find two different sentences that equal 18?.....

EXERCISES INVOLVING THE 4 RULES

CALLING CARDS

The aim of this game is to speed up mental arithmetic and is played in groups (max. 13 pupils).

Instructions:-

1) Prepare a set of cards as shown:

70 ÷ 7	10 x 12	120 ÷ 8	15 x 6	90 ÷ 10	9 x 14
126 ÷ 3	42 ÷ 7	6 x 14	84 x 2	168 ÷ 3	56 ÷ 4
14 x 5					

2) Give all the cards out (some pupils may have more than one card).

3) One child starts and calls out the sum on their card and places the card on the desk.

4) The child whose card has the answer as the first number on their card puts their card on the desk and reads out the sum.

5) Continue until all the cards form a chain and the first number is reached again. (see order above!)

6) Make this competitive with the winners being the group who completes their chain of cards in the fastest time.

NB. Vary the degree of difficulty to match the ability of the children. Alternatively use addition and subtraction chains.

Extension

Let the children make their own chains.

1 - 9 CARDS

1) Choose any four cards from the set

Use some or all of the 4 numbers and any mathematical symbols - make all the totals from 1 to 20.

e.g. $1 + 2 + 3 + 4 = 10$

$1 + 2 + 3 - 4 = 2$ etc.

2) Pick 3 cards, add 2 of the numbers and multiply the total by the 3rd number. Obtain a total as near to 20 as possible.

e.g. $(2 + 4) \times 3 = 18$

$(4 + 3) \times 2 = 14$

$(3 + 2) \times 4 = 20$

Try to find different totals e.g.. 15, 30, 40, etc.

3) Make a 10 x 10 grid with numbers 1 to 100.
Select 3 cards. Use any mathematical operation to combine the 3 numbers to make totals from 1 to 100. Use the numbers once and only once.

e.g.. $6 + 5 + 2 = 13$

$6 \times (5 + 2) = 42$

$(5 \times 2) - 6 = 4$

$(6 \times 5) \div 2 = 15$

$65 - 2 = 63$

etc.

The Answer Is -----

Tell the class that the answer to a maths question is 10.

Ask them to think of as many questions as possible which would give an answer of 10.

e.g.. $5 + 5 = 10$
$100 \div 10 = 10$ etc.

See who can get the longest list of questions! (It may be wise to restrict the questions to 2 digits and one operand).

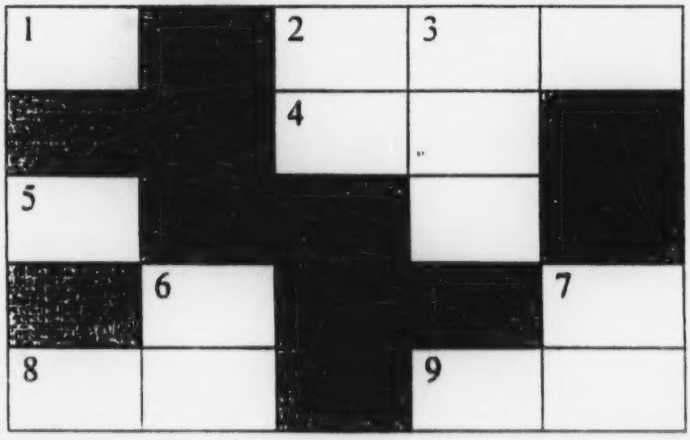
Repeat the exercise with a different number.

Games and puzzles

Cross number

Across

1. 6 + 2
2. The first three numbers
4. 5 + 6 - 1
5. 10 ÷ 2
6. 2 x 2
8. Half of one hundred
9. 100 - 5



Down

2. 8 + 3
3. 100 + 100
6. 4 x 10
7. Three lots of five

This cross number is small enough to be written on the blackboard.

Children could try making their own - let them work in groups.

WORD PROBLEMS

Maths word search

Look for :

zero
quarter
million
one
eleven
circle
ten
square

q	u	a	r	t	e	r	g
t	w	v	o	e	f	o	h
a	b	p	z	n	r	t	s
e	l	e	v	e	n	i	q
r	c	q	z	j	u	n	u
m	i	l	l	i	o	n	a
y	s	x	k	e	n	l	r
c	i	r	c	l	e	m	e

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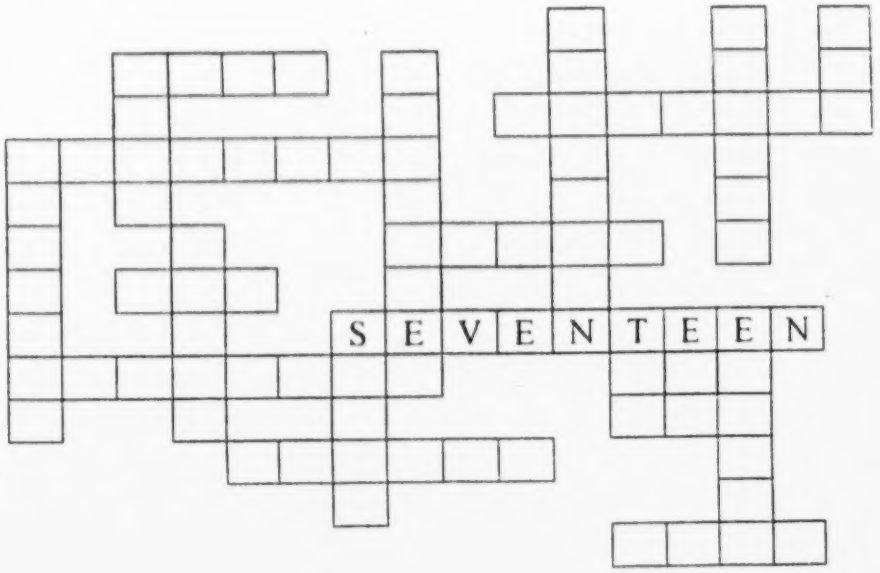
SPELLING

Fill in the spellings of the numbers 1 to 20.
Use a dictionary if you want to.
Number 17 has been done for you.

1		11	
2		12	
3		13	
4		14	
5		15	
6		16	
7		17	SEVENTEEN
8		18	
9		19	
10		20	

Write all the number words is this word link.
Number 17 has been put in for you.



This is not as easy as it looks. Use a pencil and rubber.

NUMBER VALUES

Use a set of cards numbered 0, 1, 2, --------- 9. Can you make:

1) A number between 40 and 50

2). A number less than 30

3) A number greater than 90

4) A number greater then 20 , less than 25

5) A number 10 more than 33

6) A number in the 5 times tables

7) A number in the 3 times tables

8) A number in the "any" times tables

9) An even number between 20 and 30

10) An odd number between 50 and 55

11) A number that differs from 60 by 1

12) A number that differs from 70 by 2

13) Two consecutive 2 digit numbers

14) Two consecutive 2 digit odd numbers

15) Two consecutive 2 digit even numbers.

IS THIS POSSIBLE?

Copy each of these "facts". Write 'YES' if it is possible , 'NO' if impossible.

1) Some months have 6 Mondays.

2) A van is more than 50 metres long.

3) A pencil weighs about 50 grams.

4) A baby weighs about 3 kg.

5) Some years have more than twelve months.

6) Some weeks have less than 8 days.

7) A kg of steel weighs more than a kg of feathers.

8) A rectangle can be larger than a square.

9) Some buildings are about a kilometre tall.

10) Some mountains are about a kilometre high.

CONCLUSION

We hope that now you have reached this part of the booklet that you will have tried and tested some of the activities and found some useful exercises to use with your class.

We feel sure that the children are well motivated and are developing an interest in mathematics.

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We hope that this resource book will encourage teachers to experiment with new ideas. Let us make maths lessons enjoyable - it is a subject which many children find difficult - many children are afraid of mathematics - let us try and turn it into a subject which they enjoy and look forward to. The earlier we build up their confidence the nearer they are to success.

ANSWERS

ANSWERS

1) 'SUMS TO : 20

Possible groups : 12 + 8, 10 + 10, 5 + 3 + 6 + 4 + 1
3 + 5 + 8 + 4, 8 + 7 + 5, 10 + 7 + 2 + 1, 12 + 7 + 1,
13 + 6 + 1, 11 + 7 + 2, 14 + 5 + 1, 14 + 6,
13 + 5 + 2, 13 + 4 + 3, 10 + 8 = 2, 10 + 7 + 3,
10 + 6 + 4, 10 + 6 + 3 + 1, (etc.)
14+2+4, 11+5+4, 9+1+10, 9+2+1+6, 9+5+6,
6+4+7+3, 12+6+2, 12+5+3, 11+9, 11+8+1, 11+6+3,
11+5+4

2) 'SUMS TO': 100

17+81+2, 94+5+1, 47+27+26, 25+38+37, 33+19+48,
55+1+44, 48+33+19

3) Find the Squares

6 1	4 3	5 3	2 1	1 1	5 3	3 2
3 0	2 1	1 1	5 2	2 6	2 1	1 4

4) Arithmogons

(1) 15 / 16 — 17

(2) 16 / 17 — 23

(3) 37 / 38 — 41

(4) 55 / 37 — 52

(5) 33 / 49 — 50

(6) 60 / 74 — 62

5) Pairs

To 9: 7+2, 6+3, 1+8, 4+5, 2+7, 8 + 1 = 2 + 7 = 6 + 3 = 3 + 6

To 10: 3+7, 9+1, 4+6, 1 + 9 = 5 + 5

(3) = 1+2
(5) = 4 + 1
(6) = 4 + 2
(7) = 3 + 4
(8) = 6 + 2
(9) = 3 + 6

(10) = 9+1
(11) = 7 + 4
(12) = 8+4
(13) = 8 + 5
(14) = 8+6
(16) = 9+7

No totals for 4 and 15

(17) = 9 − 8

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6) ADD PAIRS

To 8

2+6, 3+5, 1 + 7, 3 + 3, 5 + 5

To 12

7 + 5, 3 + 9

(3) = 1+2
(4) = 2 + 2
(6) = 1+5
(7) = 6 + 1
(8) = 2+6
(9) = 6 + 3
(10) = 9+1
(11) = 2+9
(12) = 9+3
(13) = 5+8
(14) = 9 + 5
(15) = 6 + 9

No total for 5

7) MORE PAIRS

(1) = 1 + 0
(2) = 1+1
(3) = 1+2
(4) = 1+3
(5) = 2 + 3
(6) =4+2
(7) = 3+4
(8) = 3+5
(9) = 3 + 6
(10) = 7 + 3
(11) = 5+6
(12) = 6-6

No 5 is left(bottom centre)

8) MORE PAIRS

Let children check their own.

9) Number Plaits

(1) 5 / 4
(2) 5 / 11 / 9
(3) 5 / 7 / 0
(4) 2 6 / 5
(5) 5 / 7
(6) 3 / 4 / 2
(7) 5 / 3 / 2 / 6
(8) 5 / 2 / 4 / 5 / 6
(9) 4 / 7 / 3 / 8 / 5 / 6

10) MEANDERING

5-1-3-6+9= 24
5-1-2-6+9= 23
5+1-2-8+9= 25
5-4-2-6+9= 26
5-4-2-8+9= 28
5-4-7-8+9= 33

Rearranging Combinations often remain the same - make sure children check this.

11) PYRAMIDS

(answers underlined)

1a) 8 / 3 5 / 1 2 3

(1b) 22 / 8 14 / 3 5 9

1c) 40 / 15 25 / 5 10 15

1d) 80 / 30 50 / 10 20 30

1e) 51 / 24 27 / 8 16 11

1f) 96 / 45 51 / 26 19 32

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2)

12	38	36
5 7	18 20	18 18
2 3 4	7 11 9	9 9 9
66	32	63
24 40	15 17	43 20
13 23 17	7 8 9	30 13 7
19	39	16
15 4	23 16	4 12
14 1 3	16 7 9	0 4 8

Make sure children investigate 1g, 3 and 4.

12) Addition Crosses

1a)
4
6 1 7
5

1b)
3
9 4 13
7

1c)
5
6 4 10
9

2a)
6
3 10 13
16

2b)
9
2 6 8
15

2c)
4
12 6 18
10

3a)
6
3 10 13
16

3b)
3
10 8 18
11

3c)
1
6 13 19
14

3d)
27
5 18 23
45

3e)
23
8 8 16
31

3f)
18
28 25 53
43

4a)
2
8 5 13
7

4b)
1
12 6 18
7

4c)
3
9 7 16
10

4d)
2
18 6 24
8

4e)
9
25 6 31
15

13) MAGIC SQUARES 'Nine Square' (Answers shown)

1a)
_ _ 15
_ _ 8
12 11 23

1b)
8 _ _
_ 3 6
11 _ 20

1c)
_ 3 9
11 10 _
17 _ _

1d)
0 _ 8
3 _ _
3 17 _

1e)
_ 8 19
3 _ 18
_ 23 _

1f)
0 16 _
_ 0 14
14 _ _

1g)
8 2 _
_ 11 32
_ _ 42

1h)
6 _ _
16 _ _
22 9 3

1i)
0 0 0
0 0 0
0 0 0

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14) MAGIC SQUARES (4 x 4)

1) (34)

_	_	_	14
2	_	8	_
_	3	_	5
_	_	15	_

2) (54)

_	_	18	_
_	_	7	12
9	_	_	14
_	_	_	11

3) (34)

_	_	2	_
_	_	11	8
9	_	_	12
4	15	_	_

4) (34)

_	_	13	_
_	_	2	7
4	_	_	9
_	_	2	6

5) (34)

_	_	3	_
5	_	10	8
_	_	_	_
4	14	_	1

15) MAGIC SQUARES (9 x 9)

Magic number = 369
Missing Numbers:
Row 1 = 76, Row 2 = 65, 24
Row 3 = 64, 53 Row 4 = 22, 62, 83 Row 5 = 1
Row 6 = 30, 10 Row 7 = 18 Row 8 = 78, 7, 28
Row 9 = 67, 36

16) CLUELESS

Many answers - let children discuss and check.

17) MAGIC SQUARES (5 X 5)

(A) Row 1 = 1, 9, 27, Row 5 = 30, 25, 18
(B) Row 1 = 3, 13, 28 Row 3 = 26, 21 Row 5 = 8, 12, 2

18) Consecutive 50's

Promote discussion and let the children check their answers - much mathematical discussion and checking will result.

19) MAGIC CIRCLES

Missing Numbers:

5	4	1
6		2
	3	

20) MAGIC CIRCLES 2

Children check their own.

21) 0 - 9 CARDS

16 = 9 + 7 14 = 8 + 6 2 = 0 + 2 9 = 4 + 5 4 = 3 + 1
11 = 9 + 2 10 = 7 + 3 9 = 5 + 4 8 = 8 + 0 7 = 6 + 1

22) 0 - 9 GRIDS

4	5		2	8	6		3	0	4
6	9		4	7	3		5	1	9
							6	2	8

23) 0 - 9 CARDS

Children discuss and check.

24) INVESTIGATIONS

Children discuss and check.

25) MULTIPLICATION TABLES - mixed up grid

Children check.

26) SPEED TEST

1st Column 48, 45,72, 42, 16, 30, 24, 21, 70, 0, 54, 18, 15, 36, 0, 49, 8, 36, 56, 18, 40, 45, 42, 36, 27.

2nd Column 27, 24, 63, 36, 48, 21, 40, 28, 20, 54, 35, 32, 24, 45, 42, 30, 72, 56, 36, 49, 20, 54, 25, 24, 56.

27) MULTIPLICATION CROSSES

1a)
		4
	10	

1b)
	4	
	5	

1c)
	4	24

1d)
	6	
5		

1e)
	6	
		28

1f)
	6	
	1	

1g)
	9	
		35

1h)
		40
	60	

1i)
	20	
8		

2a)
	2	
4	5	20
	10	

2b)
	3	
2	6	12
	18	

2c)
	2	
7	4	28
	8	

2d)
	3	
6	5	30
	15	

2e)
	10	
6	4	24
	40	

2f)
	2	
3	0	0
	0	

28) MULTIPLICATION GRIDS Missing Numbers

1) Row 2 = 12
Row 3 = 10

2) Row 3 = 10
Row 4 = 21

3) Row 2 = 10
Row 3 = 3
Row 4 = 28

4) Row 2 = 2, 4
Row 3 = 18

5) Row 1 = 4
Row 2 = 3

6) Row 1 = 1
Row 2 = 40, 5
Row 3 = 48

7) Row 1 = 2, 7
Row 2 = 1, 3
Row 3 = 2, 14
Row 4 = 5, 15, 35

8) Row 1 = 6, 5
Row 2 = 1
Row 3 = 2

9) Row 1 = 3, 7
Row 2 = 3
Row 3 = 7

29) 0 - 9 CARDS

Multiples of 2: 18, 56, 72, 84, 90
Multiples of 3: 3, 9, 12, 45, 60, 78
Multiples of 7: 14, 28, 35, 49, 70

NB Many answers

30) 0 - 9 CARDS — Children check their group's answers.

31) TABLE CODES — Reads : TABLES ARE FUN

32) 0 - 9 CARDS — Many answers - let children discuss and check.

33) 1 TO 9 CARDS. — Many answers - let children discuss and check.

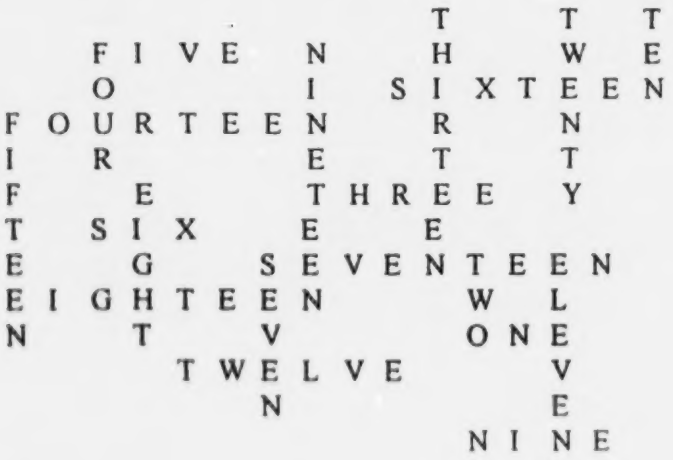
34) The answer is ..... — Many answers - let children discuss and check.

BEST COPY AVAILABLE

35) GAMES AND PUZZLES

ACROSS 1) 8 2) 1, 2, 3 4) 10 5) 5 6) 4 8) 50 9) 95
DOWN 2) 11 3) 200 6) 40 7) 15

36) SPELLINGS



37) NUMBER VALUES

Children check.

38) IS THIS POSSIBLE

1) N 2) N 3) N 4) Y 5) N 6) Y 7) N 8) Y 9) N 10) Y